

## A NOTE ON THE LEAF BUDS OF ANGOPHORAS.

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(Four Text-figures.)

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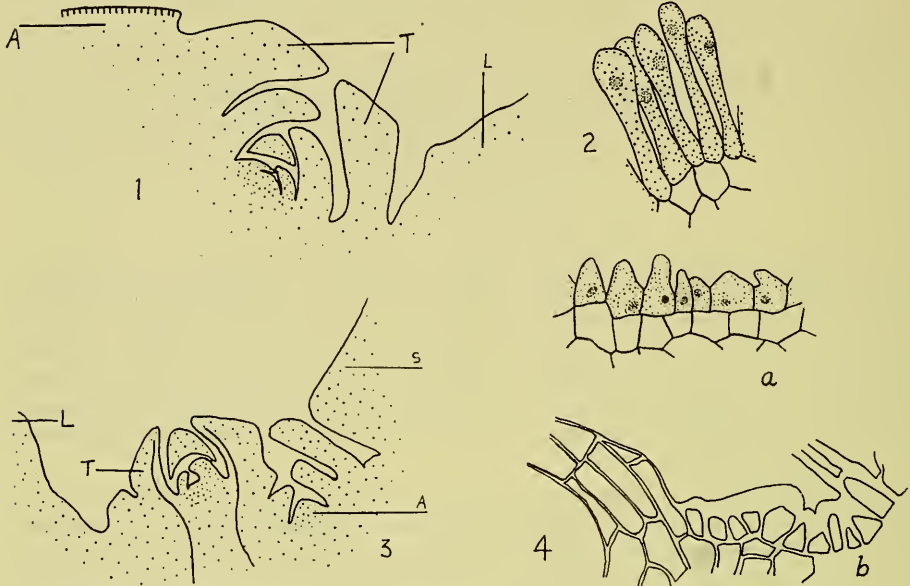
In a recent paper concerning leaf-bud structure in New South Wales perennials (Carey, 1930), the bud of *Angophora lanceolata* Cav. was classed as a microscopic bud which gave rise on expansion to a shoot of a type intermediate between that formed from a scaly bud and that from a naked bud. However, a full description of the bud of *Angophora lanceolata* was not given, it being described "as an ill defined axillary swelling". Further examination shows that this axillary swelling is in reality a deep-seated bud of peculiar type, in which the primordia are well differentiated.

In all species of *Angophora* the leaves are opposite and the inflorescence is borne terminally so that all leaf buds occur in an axillary position. A common feature of this genus is the presence of a second or accessory bud, one occurring in the axil of each leaf, between the growing bud and the stem (Text-fig. 3). This occurrence is general in four of the five species described; it is less usual in *Angophora lanceolata*.

The leaf bud of *Angophora lanceolata* is an invaginated one, the growing apex being depressed as in *Isoetes* (Lang, 1915), only to a less extent (Text-fig. 1). The outer rudiments in the dormant bud each show a conducting strand of spiral elements close to the adaxial surface. The parenchymatous cells contain an abundance of calcium oxalate in the form of druses, and occasionally young schizogenous glands are found. These partially mature structures are the outer transitional forms of the open bud. The term "transitional form" has been applied by Foster (1929) to those structures which occur on the shoot arising from a scaly bud between the true scales and the first true leaf. The writer has applied this term to similar structures occurring on the outside of a bud of the "intermediate" type (Carey, 1930). On the expansion of the bud these transitional forms, although buds appear on their axils, themselves show only a slight degree of development. Passing inwards in the bud each successive pair of rudiments shows less divergence from the meristematic cone. This cone occupies but a small area only a few cells in depth and the elongation zone behind it is very short, with the result that it comes to lie at the bottom of a pit.

The bud is covered by a rubbery secretion of the nature of caoutchouc described by Welch (1923). This secretion helps to mask the bud and make its position in the axil of the leaf indistinguishable. This covering is secreted by the papillate epidermal cells of the foliar rudiments (Text-fig. 2). Similar epidermal cells on the young leaves of *Eucalyptus corymbosa* have already been figured by Welch (1923) and those occurring in *Angophora lanceolata* are mentioned by him.

The epidermal cells found on the outer transitional forms of *A. lanceolata* as seen in Text-figure 2 are more elongated and hair-like than those recorded for *Eucalyptus corymbosa* and occasionally show one or two transverse walls.



Text-fig. 1.—The dormant bud of *Angophora lanceolata*. L, leaf; A, stem apex; T, transitional form.  $\times 40$ .

Text-fig. 2.—Papillate epidermal cells occurring on the transitional forms of a leaf bud of *Angophora lanceolata*.  $\times 350$ .

Text-fig. 3.—An expanding bud of *Angophora subvelutina*. L, leaf; S, stem; T, transitional form; A, accessory bud.  $\times 40$ .

Text-fig. 4.—A. The epidermal cells of a developing primordium of *Angophora cordifolia*.  $\times 350$ . B. The epidermal cells of a transitional form of *Angophora cordifolia*.  $\times 350$ .

With the advent of the growing season, rapid division and elongation begins at the apex of the meristematic cone, so that the younger primordia are carried above the level of the outer organs of the bud. As soon as this extension begins the bud becomes quite obvious to the naked eye and assumes the appearance which has already been figured (Carey, 1930).

*Angophora subvelutina* F.v.M. has a similar but smaller leaf bud than that of *A. lanceolata*. It is covered by the same type of secretion, produced in papillate epidermal cells. An expanding bud of this species is shown in Text-figure 3, together with a dormant accessory bud. The latter is gradually crushed out by the growth of the former. The expanding shoot shows transitional forms similar to those of the shoot of *A. lanceolata*.

*A. Bakeri* C. Hall and *A. intermedia* D.C. have leaf buds similar to those of *A. lanceolata*.

*Angophora cordifolia* Cav. has also a hidden bud. The leaf axil is usually flattened and in it occur two buds further apart than in the other types. The outline of the bud is similar to that of *A. lanceolata*, except that the bud is broader

and flatter than in that type. The epidermal cells of the young primordia appear slightly papillate (Text-fig. 4, A), but the outer more mature rudiments of the bud show the development of the emergences and hairs characteristic of the species as is shown in Text-fig. 4, B. The expansion of this shoot has already been mentioned (Carey, 1930).

*Literature Cited.*

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